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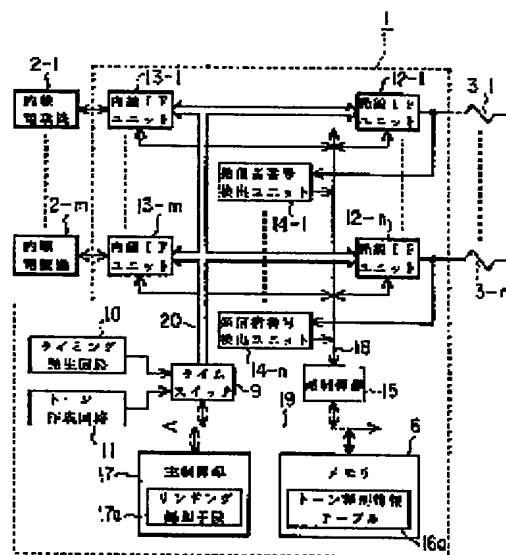
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(54) COMMUNICATION TERMINAL EQUIPMENT AND KEY TELEPHONE SYSTEM

(57)Abstract:

PURPOSE: To make a user able to roughly recognize a speaker just by listening to a ringing tone by selecting the ringing tone corresponding to ringing tone kind information from the plural kinds of the ringing tones prepared by a ringing tone preparation means and performing ringing.

CONSTITUTION: A tone kind information table 16a is set in the partial area of a memory 16 and tone kind information for indicating the kinds of the ringing tones corresponding to telephone numbers is stored in the tone kind information table 16a. Then, at the time of an incoming call, when the ringing tone kind information is stored in the tone kind information table 16a corresponding to the number of the origin of the call informed from a network, the ringing tone corresponding to the ringing tone kind information is selected from the plural kinds of the ringing tones prepared by a tone preparation circuit 11 by a ringing processing means 17a and the ringing is performed corresponding to the selected ringing tone.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the communication terminal and key telephone set which are connected to the network with which the number of a sending agency is notified to an arrival-of-the-mail place.

[0002]

[Description of the Prior Art] There is a thing with the function which notifies an addresser number to the subscriber of a destination side in the existing analog telephone network like the analog telephone network which offers service called "CLASS" currently offered in the United States of America.

[0003] And in communication terminals, such as a key telephone set connected to such a network, while performing a ringing at the time of arrival of the mail and reporting arrival of the mail to a user, what an addresser's number is displayed on a drop and a user is notified of is performed.

[0004] According to such a communication terminal, a user can recognize an addresser, before answering arrival of the mail. However, the ringing tone is being fixed to one kind in the conventional communication terminal. Therefore, before reporting generating of arrival of the mail was only completed but the user answered the addresser of the arrival concerned, it had to view the contents of a display of a drop and had the fault of becoming a user's burden to know a ringing tone.

[0005]

[Problem(s) to be Solved by the Invention] As mentioned above, in order for a user to be able to know only generating of arrival of the mail by the ringing tone since the ringing tone is being fixed to one kind, but to know an addresser conventionally, the contents of a display of a drop had to be viewed and there was fault of being troublesome.

[0006] The place which this invention is made in consideration of such a situation, and is made into the purpose can recognize an addresser roughly only by a user hearing a ringing tone, and it

is in offering the communication terminal and key telephone set which can reduce the frequency where a user views the contents of a display of a drop by this, and can mitigate a user's burden.
[0007]

[Means for Solving the Problem] In the communication terminal by which the 1st invention is connected to the network with which the number of a sending agency is notified to an arrival-of-the-mail place in order to attain the above purpose Ringing tone creation means, such as for example, a tone creation circuit which creates two or more kinds of ringing tones to arbitration, Storage means to match with the number corresponding to other communication terminals, and to memorize either of the ringing tone classification information corresponding to each of two or more kinds of ringing tones which can create said ringing tone creation means, such as for example, a tone classification information table, If it has a ringing processing means, it matches with the number of the dispatch origin notified from said network at the time of arrival of the mail and ringing tone classification information is memorized by said storage means It chooses from from among said two or more kinds of ringing tones to which said ringing tone creation means creates the ringing tone corresponding to that ringing tone classification information with said ringing processing means, and was made to carry out a ringing according to this selected ringing tone.

[0008] Moreover, the 2nd invention is set to the key telephone set connected to the network with which the number of a sending agency is notified to an arrival-of-the-mail place. Ringing tone creation means, such as for example, a tone creation circuit which creates two or more kinds of ringing tones to arbitration, Storage means to match with the number corresponding to other communication terminals, and to memorize either of the ringing tone classification information corresponding to each of two or more kinds of ringing tones which can create said ringing tone creation means, such as for example, a tone classification information table, If it has a ringing processing means, it matches with the number of the dispatch origin notified from said network at the time of arrival of the mail and ringing tone classification information is memorized by said storage means It chooses from from among said two or more kinds of ringing tones to which said ringing tone creation means creates the ringing tone corresponding to the ringing tone classification information with said ringing processing means, and was made to give to the extension terminal of an arrival-of-the-mail place.

[0009] Moreover, the 3rd invention is matched with each of further two or more extension terminals in ringing tone classification information in the storage means of said 2nd invention, and the ringing processing means was made to carry out the ringing of each extension terminal in the ringing tone corresponding to what was matched with the number of the dispatch origin notified among the ringing tone classification information corresponding to the extension.
[0010]

[Function] If it matches with the number of the dispatch origin notified from the network by having provided these means at the time of arrival of the mail and ringing tone classification information is memorized by the storage means, by the ringing processing means, the ringing tone corresponding to that ringing tone classification information will be chosen from from among two or more kinds of ringing tones which a ringing tone creation means creates, and a ringing will be made according to this selected ringing tone. Therefore, if a user matches with the partner telephone number and sets up ringing tone classification information, a ringing tone can be changed into arbitration according to a sending agency.

[0011]

[Example] Hereafter, with reference to a drawing, it explains per example of this invention.

Drawing 1 is the functional block diagram showing the important section configuration of the key telephone set concerning this example. In addition, the key telephone set connected to the analog telephone network which is offered in the United States of America, and which offers service (it has the function which notifies an addresser number to the subscriber of a destination side) called "CLASS" is illustrated here.

[0012] This key telephone set comes to connect the m extensions 2 ($2-1 - 2-m$) with the main unit 1, respectively. The main unit 1 The main wire interface unit 12 ($12-1 - 12-n$) of a time switch 9, the timing generating circuit 10, and 11 or n tone creation circuits, The addresser number detection unit 14 ($14-1 - 14-n$) of m extension interface units [13 ($13-1 - 13-m$) or n], It has the sub control section 15, memory 16, and the main control section 17, and the main wire interface unit 12, the extension interface unit 13, and the addresser number detection unit 14 are connected to the sub control section 15 through the data highway 18. Moreover, a time switch 9, the sub control section 15, and memory 16 are connected to the main control section 17 through the bus 19.

[0013] The tone creation circuit 11, the main wire interface unit 12, and the extension interface unit 13 are connected to the time switch 9 through the PCM highway 20, respectively, and the tone creation circuit 11, the main wire interface unit 12, and the extension interface unit 13 are switched in arbitration by replacing the time slot on the PCM highway 20 based on various kinds of timing signals generated in control of the main control section 17, and the timing generating circuit 10.

[0014] The tone creation circuit 11 carries out the creation output of various kinds of tone signals for giving to the extension 2 by the PCM signal. This tone creation circuit 11 has the function which carries out the creation output of two or more kinds of ringing tones at coincidence, although a ringing tone also carries out a creation output.

[0015] n main wires 3 ($3-1 - 3-n$) are respectively connected to the main wire interface unit 12. The main wire interface unit 12 is the thing of the configuration of common knowledge containing the arrival-of-the-mail detector 120, the rectifier circuit 121 which consists of a diode bridge, the direct-current control circuit 122, the codec 123 which performs PCM coding and a decryption of a sound signal, and the control sections (arrival-of-the-mail detection, circuit seeds, dial feed appearance, etc.) 124 which control this unit under control of the main control section 17, as shown in drawing 2 . In this main wire interface unit 12, main wire interface actuation of conversion to the PCM signal of the sound signal (analog) which comes through a main wire 3, conversion to the sound signal (analog) of the PCM signal given through a time switch 9, the house keeping of a main wire 3, sending out of various signals to the network connected through the main wire 3, etc. is performed. Moreover, the main wire interface unit 12 performs transfer of the control information concerning the above-mentioned main wire interface actuation between the main control sections 17 through the sub control section 15.

[0016] The extension 2 is respectively connected to the extension interface unit 13. The extension interface unit 13 is the thing of the configuration of common knowledge containing the digital transmission section 132 which performs transmission and reception of the control data between the control section 130 which manages transmission and reception of control data through a data highway 18, the memory 131 as external memory of a control section 130, and the extension 2 and the main unit 1, or voice data, as shown in drawing 3 . In this extension interface unit 13, extension interface actuation of conversion to the PCM signal of the sound signal (analog) outputted from the extension 2, conversion to the sound signal (analog) of the PCM signal given through the time switch circuit 11, the house keeping of the extension 2, sending out of various signals to the extension 2, etc. is performed. Moreover, the extension interface unit 13 performs transfer of the control information concerning the above-mentioned extension interface actuation between the main control sections 17 through the sub control section 15.

[0017] The addresser number detection unit 14 is respectively connected to the main wire 3. The relay 140 for the addresser number detection unit 14 to separate this unit from a main wire 3, as shown in drawing 4 , The demodulator circuit 141 for receiving and restoring to the modulating signal which comes through a main wire 3, The serial/parallel-conversion section 142 for parallel-izing the received data outputted from a demodulator circuit 141, The data detecting-signal transmitting section 144 for transmitting the data detecting signal outputted from a demodulator circuit 141 to an internal data bus 143, The relay control section 145 which

controls relay 140 in order to separate this unit from a main wire 3 and to plan impedance matching at the time of dial feed appearance and a message etc., It is the thing of the configuration of common knowledge containing the control section 146 which manages control of this unit, and the memory 147 as external memory of a control section 146. The addresser number detection unit 14 receives and detects the addresser number data given from a network through a main wire 3, and gives the received addresser number data to the main control section 17 through the sub control section 15.

[0018] The sub control section 15 is constituted considering a microcomputer as a subject, and mediates transfer of the data between the main wire interface unit 12, the extension interface unit 13 and the addresser number detection unit 14, and the main control section 17.

[0019] what is used as external memory for the main control section 17 to store various kinds of data, as for memory 16 -- it is -- the part -- tone classification information table 16a is set to the field. This tone classification information table 16a is for memorizing the tone classification information which it matches with the telephone number and shows the classification of a ringing tone, as shown in drawing 5, and is the extension 2-1 - 2-m. The telephone number and two or more sets of tone identification information are memorizable at a time to each.

[0020] The main control section 17 controls each part so that it may realize exchange actuation. This main control section 17 is constituted considering a microcomputer as a subject, and, in addition to the general control means of the common knowledge in the key telephone system main unit, has ringing processing means 17a. Ringing processing means 17a makes the ringing using the ringing tone which the ringing tone for reporting the arrival chose and chose perform here based on the addresser number detected by the addresser number detection unit 14-1 - 14-n at the time of arrival of the mail.

[0021] Next, the actuation at the time of the arrival of the key telephone set constituted as mentioned above is explained focusing on processing by ringing processing means 17a. First, with this key telephone set, when a user performs predetermined directions actuation in the extension 2, it can match with the telephone number of the partner of arbitration set to tone classification information memory 16a with a message partner, and the ringing tone of arbitration can be set up.

[0022] That is, for example, the depression of the push button of the extension 2 is carried out in the order *99 XXXXXXXXXX*YY## Becoming. In addition, the tone number and "##" by which the telephone number of the partner who wants to register a special code for "*99" to specify a setup of a ringing tone and "XXXXXXXX", and "*" were given to assignment of input termination of the telephone number, and "YY" was given to each of two or more kinds of ringing tones which can create the tone creation circuit 11 show assignment of input termination of registration information, respectively.

[0023] And in the main control section 17, when the above actuation is performed by telephone 2, the above-mentioned contents of an input are identified, and the telephone number and a tone number are matched and written in the field corresponding to the extension 2 by which the above-mentioned actuation of tone classification information table 16a is made.

[0024] By the way, in the analog telephone network to which the key telephone set of this example is connected, it superimposes on a call signal and a modulating signal is sent to a subscriber. Drawing 6 is drawing showing a format of the modulating signal on which it is superimposed with the call signal in the above "CLASS." to be shown in this drawing, a call signal sandwiches the bell stopping period for 4 seconds, is a signal outputted repeatedly every [during 2 seconds] about the bell signal of predetermined frequency, and pass the pause period for 0.5 seconds after termination of the 1st bell signal -- a modulating signal is transmitted. The air time of this modulating signal is 575ms, and is the signal which modulated the identification information of a format as shown in drawing 7. Time information (at the moon, a day, the time part) and an addresser number are contained in identification information.

[0025] Now, the call signal sent out from the station exchange is a main wire 3-1. When it minds and comes, this call signal is a main wire 3-1. It is detected in the arrival-of-the-mail detector

120 of the connected main wire interface unit 12-1. And the purport by which the call signal was detected is notified to the main control section 17 through the control section 124, the data highway 18, the sub control section 15, and the bus 19 of the main wire interface unit 12-1.

[0026] Moreover, the 1st bell signal is followed and a modulating signal is a main wire 3-1. It minds, and if it comes, it will be received by the addresser number detection unit 14-1, and this modulating signal will be given to the main control section 17. That is, specifically, a modulating signal is given to the main control section 17 through the internal data bus 143 of the addresser number detection unit 14-1, the control section 146 of the addresser number detection unit 14-1, a data highway 18, the sub control section 15, and a bus 19, after getting over in a demodulator circuit 141, reproducing addresser number data and this addresser number data's being changed into parallel data by the serial/parallel-conversion section 142.

[0027] Now, the main control section 17 is awaiting that the 1st bell signal is detected, as shown in drawing 8 (step ST 1), and if call signal detection is notified to the beginning from the main wire unit 12-1, it will perform incorporation of an addresser number (step ST 2). That is, the addresser number data notified from the addresser number detection unit 14-1 as mentioned above are incorporated.

[0028] Then, the main control section 17 carries out the increment (0 ***** of I is carried out in the initial state) of the contents of the variable I in one (step ST 3). It is the extension (in this example) of sound-volume information table 16a to #I about the telephone number which the addresser number data furthermore incorporated in a step ST 2 next show. the extension 2-1 - 2-m **** -- it is related that the management number of #1 - #m shall be attached, respectively, and it searches (step ST 4). And if it judged whether the main control section 17 has detected the corresponding information (step ST 5), and it has detected, and it is set as the predetermined field of memory 16 (step ST 6) and has not detected so that the ringing tone which the information shows may be given to the extension of #I, it is set as the predetermined field of memory 16 so that a predetermined standard ringing tone may be given to the extension of #I (step ST 7).

[0029] After finishing processing of a step ST 6 or a step ST 7, the main control section 17 judges whether Variable I has become more than m, and it repeats processing of a step ST 3 thru/or a step ST 8 until Variable I results in m. Thereby, they are the extension 2-1 - 2-m. A setup of a ringing tone is made about each.

[0030] And Variable I results in m and they are the extension 2-1 - 2-m. After a setup of the ringing tone about each is completed, the main control section 7 is the extension 2-1 - 2-m. It awaits that either carries out an arrival-of-the-mail response, and a line connection is performed, or detection of the bell signal after the 2nd bell signal is notified (a step ST 9 and a step ST 10).

[0031] They are the extension 2-1 - 2-m here. If it is notified from the main wire interface unit 12 that the bell signal after the 2nd bell signal came before a response is made in either, the main control section 17 will perform processing for sending out a ringing tone to each extension 2 by giving this notice a trigger (step ST 11). In addition, this processing controls a time switch 9 to be given to the extension 2 to which two or more kinds of tone signals the tone creation circuit 11 carries out [signals] a creation output correspond based on the correspondence relation of the each extension 2 and the ringing tone which were set as the predetermined field of memory 16 at a step ST 6 or a step ST 7. The ringing in a corresponding to addresser respectively ringing [extension / 2 / each] tone will be made by this.

[0032] And if a response is made in either of the extensions 2 and a line connection is performed, the main control section 17 will end ringing processing. According to this example, at the time of arrival of the mail, a ringing tone can be changed according to an addresser in this way. It is only hearing a ringing tone, and a user can recognize an addresser to some extent, views a drop depending on the case, and it becomes unnecessary therefore, to check an addresser's telephone number. In addition, if a certain ringing tone is set up to the single partner, a user can also judge an addresser certainly only at hearing a ringing tone.

[0033] moreover -- according to this example -- the extension 2-1 - 2-m Since it is alike,

respectively, and it can be related and tone classification information can be set up according to an individual, a ringing tone of the extension 2 which comes out, respectively and is different can be set up about the same partner, and the more nearly optimal ringing tone can be set up corresponding to the needs of each user of the extension 2.

[0034] In addition, this invention is not limited to the above-mentioned example. For example, although this invention is applied to the key telephone set in the above-mentioned example, application of this invention is possible to other communication terminals, such as standard telephone and the private branch exchange.

[0035] Moreover, although tone classification information is enabling registration according to an individual for every extension in the above-mentioned example, it is good also as common to all the extensions. Moreover, what is necessary is just to set up a ringing tone within the limits of it, in making only the part of the extensions 2 receive a message alternatively based on the circuit which arrival of the mail produced, or the arrival-of-the-mail first-move number specified separately although all the extensions 2 illustrate the thing used as a ringing object and it is setting the ringing tone as all the extensions 2 to 1 arrival in the above-mentioned example.

[0036] Moreover, although it shall have connected with the network which offers service called "CLASS" in the above-mentioned example, it is applicable to any of other networks. However, in setting up receiver sound volume based on an addresser number, it had the function which notifies an addresser number to a subscriber side, for example, applying to networks, such as an ISDN network, becomes indispensable. In addition, deformation implementation various in the range which does not deviate from the summary of this invention is possible.

[0037]

[Effect of the Invention] In the communication terminal which is connected to the network with which the number of a sending agency is notified to an arrival-of-the-mail place according to the 1st invention Ringing tone creation means, such as for example, a tone creation circuit which creates two or more kinds of ringing tones to arbitration, Storage means to match with the number corresponding to other communication terminals, and to memorize either of the ringing tone classification information corresponding to each of two or more kinds of ringing tones which can create said ringing tone creation means, such as for example, a tone classification information table, If it has a ringing processing means, it matches with the number of the dispatch origin notified from said network at the time of arrival of the mail and ringing tone classification information is memorized by said storage means It chooses from from among said two or more kinds of ringing tones to which said ringing tone creation means creates the ringing tone corresponding to the ringing tone classification information with said ringing processing means. Since it was made to carry out a ringing according to this selected ringing tone It is possible to recognize an addresser roughly only by a user hearing a ringing tone, and it becomes the communication terminal which can reduce the frequency where a user views the contents of a display of a drop by this, and can mitigate a user's burden.

[0038] Moreover, according to the 2nd invention, it sets to the key telephone set connected to the network with which the number of a sending agency is notified to an arrival-of-the-mail place. Ringing tone creation means, such as for example, a tone creation circuit which creates two or more kinds of ringing tones to arbitration, Storage means to match with the number corresponding to other communication terminals, and to memorize either of the ringing tone classification information corresponding to each of two or more kinds of ringing tones which can create said ringing tone creation means, such as for example, a tone classification information table, If it has a ringing processing means, it matches with the number of the dispatch origin notified from said network at the time of arrival of the mail and ringing tone classification information is memorized by said storage means Since it chooses from from among said two or more kinds of ringing tones to which said ringing tone creation means creates the ringing tone corresponding to the ringing tone classification information with said ringing processing means and was made to give to the extension terminal of an arrival-of-the-mail place It is possible to recognize an addresser roughly only by a

user hearing a ringing tone, and it becomes the key telephone set which can reduce the frequency where a user views the contents of a display of an indicator by this, and can mitigate a user's burden.

[0039] According to the 3rd invention, ringing tone classification information is matched with each of further two or more extension terminals in the storage means of said 2nd invention. Moreover, a ringing processing means Since it was made to carry out the ringing of each extension terminal in the ringing tone corresponding to what was matched with the number of the dispatch origin notified among the ringing tone classification information corresponding to the extension It is possible to recognize an addresser roughly only by a user hearing a ringing tone. The frequency where a user views the contents of a display of a drop by this can be reduced, a user's burden can be mitigated, and it becomes the key telephone set which can set up more correspondence with the number of a sending agency, and a ringing tone freely according to the situation for every extension further.

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CLAIMS

[Claim(s)]

[Claim 1] In the communication terminal connected to the network with which the number of a sending agency is notified to an arrival-of-the-mail place A ringing tone creation means to create two or more kinds of ringing tones to arbitration, A storage means to match with the number corresponding to other communication terminals, and to memorize either of the ringing tone classification information corresponding to each of two or more kinds of ringing tones which can create said ringing tone creation means, If it matches with the number of the dispatch origin notified from said network and ringing tone classification information is memorized by said storage means at the time of arrival of the mail The ringing tone corresponding to the ringing tone classification information is chosen from among said two or more kinds of ringing tones which said ringing tone creation means creates. The communication terminal characterized by providing the ringing processing means which carries out a ringing according to this selected ringing tone.

[Claim 2] In the key telephone set connected to the network with which the number of a sending agency is notified to an arrival-of-the-mail place A ringing tone creation means to create two or more kinds of ringing tones to arbitration, A storage means to match with the number corresponding to other communication terminals, and to memorize either of the ringing tone classification information corresponding to each of two or more kinds of ringing tones which can create said ringing tone creation means, If it matches with the number of the dispatch origin notified from said network and ringing tone classification information is memorized by said storage means at the time of arrival of the mail The communication terminal characterized by providing said ringing processing means which chooses from among the ringing tones of a class, and is given to the extension terminal of an arrival-of-the-mail place by which said ringing tone creation

means creates the ringing tone corresponding to the ringing tone classification information. [two or more]

[Claim 3] It is the key telephone set according to claim 2 which ringing tone classification information is matched with each of further two or more extension terminals, and is characterized by a ringing processing means carrying out the ringing of each extension terminal in the ringing tone corresponding to what was matched with the number of the dispatch origin notified among the ringing tone classification information corresponding to the extension in a storage means.

[Translation done.]